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APPLICATION FOR LETTERS PATENT

INVENTOR:

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TITLE:

Communication Triggered Just in Time Information

BACKGROUND OF THE INVENTION

Field of Invention

The present invention relates generally to the field of personal information management (PIM) systems. More specifically, the present invention is related to a system and method for

5   communication-triggered automatic retrieval of information related to a caller/sender of the communication.

Discussion of Prior Art

The definitions provided below help assist in the understanding of terminology used

10   throughout the specification. It should, however, be noted that definitions have been provided to help with general understanding of personal information management systems and are not meant to limit their interpretation thereof. Furthermore, other definitions and equivalents may be substituted therefore without departing from the scope of the present invention.

15   **Primary user** - The main user of a personal information management system implementing the present invention. It is assumed that the primary user owns and has control over the data stored in the database.

Client - An entity of interest to the primary user. The client is associated with events, to-

20   do lists, journal entries or a profile log maintained by the primary user.

iCalendar standard - Internet Calendaring and Scheduling Core Object specification, published by the Internet Engineering Task Force (IETF), is a rich data format definition for common scheduling objects such as events, to-dos, and journal entries.

5   **Event database** - In the iCalendar standard, an event is defined as a group of properties associated with an event calendar component. The event database contains records, one for each event in the system. It represents a scheduled amount of time on a calendar.

To-do database - In the iCalendar standard, a to-do is defined as a group of properties

10   associated with a to-do calendar component. The to-do database contains records, one for each to do in the system. It represents an action item or assignment.

Journal database - In the iCalendar standard, a journal is defined as a group of properties associated with a journal component. The Journal database contains records, one for

15   each journal entry in the database.

Profile database - Contains records for each client of the PIM system of the present invention. Each profile record contains more detailed information about a client, such as the client's background, education, interests, and expertise.

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Java™ Message Queue (JMQ) - Message-Oriented-Middleware that provides a common reliable way for programs to create, send, receive, and read messages in any distributed environment.

5   **Remote Procedure Call (RPC)** - a type of protocol that allows a program on one computer to execute a program on a server computer.

         Remote Method Invocation (RMI) - a set of protocols that enables Java objects to communicate remotely with other Java objects.

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         Personal Information Management (PIM) systems are tools used to store information such as addresses, scheduled events, important dates, things to be done or other valuable data. PIM systems provide users with an efficient means for organizing their private and business activities.

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         One useful capability of PIM systems is the ability of a user to associate other individuals with specific entries in the database. The primary user of the PIM system records tasks, scheduled events, to-do lists, observations, and individual profiles. Additionally, clients are related to these entries in the database. For example, in a business environment, client profiles

20   and comment/notes associated with clients are stored in a PIM database and are accessed prior to, or during, a business contact for efficient management of customer relations.

The retrieval of information in PIM systems is generally initiated by performing a manual query of the system. For example, before starting a communication with a client, the primary user searches the PIM systems using a computer program to be reminded of discussion topics or notes taken during a previous call. Data retrieval is also initiated using internal predetermined

5   events such as a time trigger that are programmed by a primary user. For example, a primary user might need to be reminded of an upcoming event some time prior to the event.

The following references describe PIM systems where the client information retrieval is initiated by the primary user of the system or by a predetermined time trigger.

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The U.S. Patent No. 5,842,009 describes a method for automatically providing a user with documents and information relevant to a scheduled event at a predetermined time prior to the event.

15   The U.S. patent No. 5,737,726 describes an information management system where customer contact information is stored and retrieved when needed. Prior contacts can be searched and located by generating filter criteria through the order-independent selection of contact types, contact sub-types, customer identification, and customer contact types.

20   The U.S. Patent No. 4,819,191 describes a method for triggering the display of data at a scheduled time using an interactive calendar. Additionally, the U.S. Patent 4,782,521 discusses a

time management system where the user inputs a to-do reminder along with a date and time where the system will display the reminder.

One problem/pitfall associated with prior art PIM systems described above is the inability

5   of such systems to automatically retrieve data from a database using an external trigger as opposed to an internal trigger. For example, when a primary user receives a call/message, it is sometimes necessary for the user to access, immediately, all the information relating to the caller/sender to efficiently handle the communication. In some cases, the primary user needs to be reminded of issues to be addressed, schedules to be reminded of or any relevant data in

10   relation to the caller/sender. Therefore, what is needed is a communication triggered automatic retrieval of information related to a caller/sender.

SUMMARY OF THE INVENTION

The present invention describes a system and method for providing a primary user with information related to a source (transmitter) of a call/message based on entries stored in a personal information management (PIM) database. In the preferred embodiment, this

5   information is provided upon the receipt of a communication and data available on the originator/transmitter of the call/message is displayed to the primary user. The system of the present invention identifies the caller/sender using an agent associated with the specific communication device/means, receiving the call/message, and retrieves associated entries in a database using the present invention's just-in-time-retrieval system that performs the task of

10   locating and gathering information related to the caller/sender. This information is then summarized and organized for display to the recipient on devices accessible by the user.

In another embodiment, the information is provided at the direct request of the primary user who supplies the system with a client identifier used to locate and gather related entries and

15   records stored in a database. The gathered information is then summarized and organized for display on a user accessible device.

In yet another embodiment, the present invention is implemented in a business model wherein one or more analysts and one or more traders implement the system of the present

20   invention in one or more electronic devices associated with them. In this model, one or more electronic devices receive an incoming communication from a callee and the system of the present invention identifies the callee, gathers information regarding identified callee, and

renders the gathered information to one or more analysts and one or more traders via one or more electronic devices.

BRIEF DESCRIPTION OF THE DRAWINGS

5   Figure 1 illustrates an overview of the system architecture of the present invention.

Figure 2 illustrates the system architecture of a preferred embodiment of the present invention.

Figure 3 illustrates a flowchart outlining a method for triggering information retrieval, as per the present invention.

10   Figure 4 extends the flowchart of Figure 3 to the preferred embodiment of the present invention.

Figure 5 illustrates a flowchart outlining the method for the retrieving information from a database.

Figure 6 illustrates a flowchart outlining the method of the gatherer using the preferred

15   embodiment.

Figure 7 illustrates a display example of the retrieved information.

Figure 8 illustrates the many to one example, wherein one or more officials from a company are able to simultaneously communicate with an analyst.

Figure 9 illustrates the many to many example, wherein one or more officials from a

20   company are able to simultaneously communicate with one or more analyst/traders.

Figure 10 illustrates the one to many example, wherein one company is able to communicate simultaneously with one or more clients.

Figure 11 illustrates a scenario wherein one or more participants implementing the system communicate with each other using a common conference call number.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

5   While this invention is illustrated and described in a preferred embodiment, the invention may be produced in many different configurations, forms, and materials. There is depicted in the drawings, and will herein be described in detail, a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and the associated functional specifications for its construction and is

10   not intended to limit the invention to the embodiment illustrated. Those skilled in the art will envision many other possible variations within the scope of the present invention.

Internet Calendaring and Scheduling Core Object specification (iCalendar) is one of the calendar standards for defining the format of calendar objects (e.g., components, properties),

15   wherein a component is an event using the iCalendar standard for extracting the various organized calendar objects. In one embodiment, the system of the present invention utilizes three iCalendar components: events, to-do and journal. It should, however, be noted that although iCalendar standards and iCalendar components have been used to illustrate the functionality of the present invention, one skilled in the art can extend this concept to encompass

20   other calendaring standards and components.

Figure 1 illustrates an overview of the system architecture **100** of the present invention. System architecture **100** includes: device agent **102** that identifies the sender/caller of the communication and triggers a request to retrieve information; primary user request manager **104** that handles direct requests from a primary user, retrieval manager **106** that controls the retrieval

5 and presentation of the data; data gatherer and locator **108** that finds the data associated with a caller/sender; database **110** that contains relevant data, and lastly, summarizer and presenter **112** that displays the data in an organized way to the primary user of the system.

The system starts with device agent **102** detecting an incoming call/message from an

10 external communication device/means and identifying the sender/caller. Alternatively, the system may be triggered by a direct request from the primary user through a primary user request manager **104**. Agent **102** or primary user request manager **104** initiates a request for data retrieval from retrieval manager **106**. It should be noted that in the preferred embodiment, the request is sent via any of, but not limited to, the following ways: sockets, messaging (e.g., JMQ),

15 remote method invocation (e.g., RMI, RPC).

Once triggered, the retrieval manager **106** invokes the gatherer and locator system **108** to locate information about the caller/sender. Data gatherer and locator system **108** then queries database **110** for information using the specific identifiers of the caller/sender and the primary

20 user.

Once the requested data is returned by gatherer and locator system **108**, retrieval manager **106** then calls the summarizer and presenter system **112** to display the data to the receiver/user depending on their preferences.

5   Figure 2 illustrates a preferred system architecture **200** of this invention where the communication devices/means are any of, but not limited to, the following: pager **202**, phone **204** or email **206**. Associated with each device/means is an agent that is pager agent **210** for the pager **202**, phone agent **212** for phone **204**, and email agent **214** for the email **206**. Device/means agents **209** monitor their associated device/means for incoming communications.

10   In case of an incoming pager message, pager agent **202** runs as a background task on the recipient's pager watching for incoming paging requests. When an incoming page arrives, pager agent **210** extracts the sender's identifier from pager **202** and then sends a request containing the identifier sender and the primary user to retrieval manager **106**. As mentioned earlier, the request is sent via any of, but not limited to, the following ways: sockets, messaging (e.g., JMQ),

15   remote method invocation (e.g., RMI, RPC).

In the case of an incoming phone call, phone agent **212** runs as a background task on the recipient's phone watching for incoming phone calls. When an incoming call arrives, phone agent **212** extracts the caller's identifier using the caller ID feature. Caller ID is a telephone

20   service that allows Customer Premises Equipment (CPE) to receive calling party's directory number and the date/time of the call. Phone agent **212** creates a request, containing the phone numbers of the calling party and the recipient to retrieval manager **106**.

In case of an incoming email message **206**, email agent **214** runs as a background task on the recipient's machine watching for incoming mail. When an incoming mail arrives for the recipient, the email agent extracts the sender's email address and creates a request containing the email addresses of the sender and the primary user to retrieval manager **106**.

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A request for data retrieval **208** is directly received from the user through primary user request manager **104**. The primary user provides the identifier of a client (on which information is needed) to primary user request manager **104** that sends a request for data to the retrieval manager **106**. Once a request is received from one of device agents **209**, retrieval manager **106**

10 invokes gatherer **218** to locate information about the designated client, in particular in relation to the primary user.

Gatherer **218** then calls locators **220** to find the information related to a caller/sender and receiver pair in the PIM database **234**. In one embodiment, the PIM database contains one or

15 more of, but not limited to, the following databases: client database **236**, event entries database **238**, to-do entries database **240**, journal entries database **242**, and profile database **244**. In the preferred embodiment, the "event", "to-do", and "journal" entries in the respective databases are a group of properties and components as defined in the previously described iCalendar standard. Associated with each of these databases are locators **220** that provide gatherer **218** with the

20 information found in a particular database.

For each database, locators **220** find the information using a set of input parameters that depend on type of incoming communication. In the preferred embodiment of this invention, the input parameters to the various information locators in the system are given below:

5   - Inputs to client entries locator **222** are the client identifier, email address, and phone number.

- Inputs to event entries locator **224** are the client identifier, primary user identifier, and the date/time window between which the events occurred/are scheduled to occur.

10   - Inputs to to-do entries locator **226** are the client identifier, primary user identifier, and date/time window between which the to dos are recorded and/or due.

- Inputs to journal entries locator **228**: client identifier, primary user identifier and date/time window between which entries occurred.

15   - Inputs to profile entries locator **230** and public data **232** locators are client identifiers.

In one embodiment, databases **234** are relational databases, and the information is retrieved using an SQL query. For example, client entries locator **222** queries client database

20 **236** for information concerning a client, given his email address, using a SQL query such as SELECT * FROM CLIENTTBL WHERE EMAILADDRESS='client@address.com'. In yet

another embodiment, profile database **244** is a simple file system where the information is located using a simple read operation to a file on a disk.

Once the information is found and returned, gatherer **218** passes the information to retrieval manager **106** that calls summarizer **248** to organize the data before its presentation to

5   the primary user.

In one embodiment, summarizer **248** sorts the data using date/time order-future followed by present and past, or vice versa. In another embodiment, summarizer **248** organizes the data based on a priority order. In yet another embodiment, a priority as well as date/time order is

10   applied to data, wherein higher priority data is itemized first as long as they are current or future items.

Finally, presenter **250** takes the output from the summarizer and presents it to the primary user. The presentation medium/device is any of, but not limited to, the following: a graphical

15   user interface (e.g., pop-up window or a refreshed web page), a computer-based device, audio device, PIM device, a pager, a telephone, or a wireless phone.

Figure 3 illustrates the steps, by means of a flow chart, of the present method of this invention for triggering the retrieval of the data. First, an external communication, such as a call

20   or an electronic message, is received **302** by a device agent associated with a particular communication means **304**. Next, the device agent extracts the primary user's identifier **306** from the communication devices/means and retrieves the recipient's identifier **308** before

sending a request to gather information from databases **310** regarding the initiator of the external communication.

Figure 4 illustrates, in further detail, the steps described in figure 3 using the
5   communication devices/means of the preferred embodiment. The figure shows the steps outlined in figure 3 for different communication means and their associated agents.

In the case of an incoming page message **402**, a pager agent detects **404** the page and initiates the extraction **406** of the sender identifier. Then, the pager agent retrieves the recipient
10   identifier **408** before requesting information **410** related to the sender to the retrieval manager along with the sender and the recipient identifiers.

In the case of an incoming email message **412**, a mail agent detects **414** the email and extracts **416** the sender's email address. Then, the email agent retrieves **418** the recipient's email
15   and sends a request **420** to gather information related to the sender along with the sender and recipient identifiers.

In the case of an incoming phone call **422**, a phone agent detects **424** the call and extracts **426** the caller phone number. Then, the phone agent retrieves **428** the recipient's phone number
20   before sending a request **430** to find information related to caller along with the caller and called party numbers.

In the case of a direct request by the primary user **432**, primary user request manager detects the user input **434** and extracts the client identifier **436** as well as the primary user's identifier **438**. Then the primary user request manager sends a request for information to the retrieval manager along with the two identifiers **440**.

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Figure 5 illustrates the steps, by means of a flow chart, of the present method of this invention for retrieving and presenting the data to the recipient. The retrieval system gets a request from an external agent for information by providing two identifiers one corresponding to a client identifier and the other to the principal user of the system **504**. The system maps transmitter identifier **506** and receiver identifier **508** to stored records in the database. Then, gatherer **510** groups located information. The gathered information is condensed by the summarizer **512** and then prepared for display by the presenter **514** before sending it for display to the specific device **516**.

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Figure 6 further illustrates the gathering step **510** outlined in figure 5 in more detail. The method describes how and what information is gathered from the PIM database in the preferred embodiment of this invention. The gatherer calls the various locators to obtain information about a client related to the primary user of the system. First, the gatherer instructs the event entries locator to find past and future event entries related to a client by providing two identifiers, one for the client and the other for the primary user of the system. The gatherer collects a predetermined number of previous events **602** and future events **604** relative to the current date. Next, the gatherer initiates the to-do entries locator to find past and future to-do entries related to

the client by providing two identifiers one for the client and the other for the primary user of the system. The gatherer collects a predetermined number of previous to-do entries **606** and future to-do entries **608** relative to the current date. Lastly, the gatherer initiates the journal entries locator to find journal entries related to a client by providing two identifiers, one for the client and one for the primary user of the system. The gatherer assembles a predetermined number of previous journal entries relative **612** to the current date. Then, the gatherer collects the client profile located by the profile locator **614** and all public data (via the Internet) available on the client **616** before sending all the gathered information on the client to the summarizer and sorter.

Figure 7 illustrates an example of the information displayed to the primary user of the preferred embodiment. The data retrieved from the database include to-do entries, future and past event entries, journal entries, profile information available in the PIM database, and public data related to a person (Dan). First, the current date is displayed in **702** and then, future to-do entries **704** and future events **706** are also displayed. Next, a list of past events **708** is displayed. Additionally, a list of journal entries **710** related to the client is also displayed. Lastly, a profile of the client **712** and public data **714** regarding the client is provided, as hyperlinks that are accessed if needed.

Unlike the prior art methods, the data shown in **700** is displayed automatically upon the receipt of a triggering external communication and does not require an internal trigger.

Examples:

1a. Many to One (Caller to Callee) Example

In this embodiment, the system of the present invention works on behalf of an agent identified as the customer agent. Figure 8 illustrates a many-to-one example wherein one or

5 more vendors/companies have access, and are able to simultaneously communicate with, a customer agent implementing the system of the present invention to perform a business transaction such as buying or selling financial securities (e.g., such as stocks, bonds, liquidities, equities, financial instruments, buying or selling goods, buying or selling services, buying, selling, or leasing real property, etc.). It should be noted that, although specific examples of

10 business transactions are provided in the specification, they are not intended to limit the scope of the present invention. In this scenario, first, a phone call is detected from a vendor agent to the customer agent. The system then recognizes the identity of the vendor and calls up any outstanding previously placed orders with the identified vendor. Next, the system queries a database to help identify suppliers of the vendor agent. In alternative embodiments, the system

15 uses a data-mining agent such as a Web crawler to identify suppliers associated with the vendor agent. As a next step, the system access websites associated with all of the identified suppliers and determines if a key supplier has reported delivery problems.

In a specific example, the vendor is Ford and the supplier is Firestone. Furthermore, in

20 this example, Ford only purchases tires from Firestone and all of these tires have been recalled, the present system receives a call from vendor (Ford) and information regarding the supplier (Firestone) is mined out of the Web and presented to a customer agent informing it of the recall

associated with the supplier's (Firestone's) tires. Lastly, the call is connected and the customer then picks up the phone, proceeds with the conversation with this knowledge in mind. The customer then makes strategic decisions, like canceling the order and placing the order with an alternative vendor, based on this extracted information.

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1b. Many to One Second Example

In this example, the system of the present invention works on behalf of an investment analyst to aid in decisions related to business transactions. As a first step, an investment analyst receives a call from a company's communication official and a Vice President (VP) for product development in NewCompany.com. Then, the system of the present invention detects this call and connects to the company's (Newcompany's) website to gather information related to the company. In this specific example, the system gathers a list of all executive officers associated with NewCompany.com. For example, the system finds an article mentioning the chief software designer and Vice President for research at NewCompany has left for competitor FastMover.com. This information (and all other articles found) is dispatched to the investment analyst. As a next step, the analyst receives this information and then picks up the phone to answer the call from the communication official and Vice President for product development in NewCompany.com. The communication official and the Vice President then inform the analyst about new changes in product strategy at NewCompany.com. The analyst is then able to decide whether to buy or sell stock holdings based on the conversation and the information retrieved by the system.

2. Many to Many Example

In this example, as illustrated in Figure 9, one or more companies are able to communicate simultaneously with an investment analyst and one or more traders implementing the system of the present invention to aid in decisions related to business transactions, such as

5   buying or selling financial securities.   An investment analyst receives a call from a communications official and the Vice President for product development at NewCompany.com. Next, the system of the present invention detects this call, identifies the callee, and connects to the website associated with the callee to gather information. In this specific example, the system gathers a list of all executive officers of NewCompany.com and searches the Web for

10   information on NewCompany and all of its identified executive officers. For example, the system could identify that the chief software designer and Vice President for research at NewCompany has left for competitor FastMover.com. As a next step, all of the identified information (e.g., all articles found on the Web) is dispatched to the terminal of an investment analyst and to one or more traders at Analysts Company. At this point any of the mentioned one

15   or more traders are able to optionally join in on the call. Lastly, the phone call connection is complete and the investment analyst picks up the phone with all the identified articles displayed in front of him. Thus, the traders and analyst have a conference call with a communications official and VP for product development at NewCompany, and the official informs them of new change in product strategy. The analyst and the traders are then able to decide whether to buy or

20   sell stock holdings based on the conversation and the information retrieved by the system of the present invention. The analyst and the traders could also decide that, based on the retrieved

information, it is in their best interest to buy stocks at FastMover.com since the VP moved from NewCompany.com to FastMover.com.

3. One to Many Example

5   In this example, as illustrated in Figure 10, a company is able to communicate simultaneously with an investment analyst and one or more traders implementing the system of the present invention, wherein the system aids the analyst and traders to perform financial transactions. One or more investment analysts receive a call from a communications official at a company such as IBM. Then, the system of the present invention detects the call in each

10   instance and connects to IBM's website and extracts company news from the website. In a specific example, the system might extract information regarding a specific product, say product A. Next, any extracted information regarding product A is dispatched to the terminal of the investment analyst and one or more traders at Analysts Company. Furthermore, the traders are also given the option of joining in the call. The phone call connection is then complete and the

15   investment analyst picks up the phone. The traders and analysts have a conference call with the communications official at IBM, who informs them about an exciting new product just announced (product A). The investment analyst then uses the extracted information, along with the information provided by the communications official, in his decision during purchasing of IBM stock.

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It should be noted that, in an extended embodiment, the participants in the many-to-one, many-to-many and one-to-many scenarios are able to simultaneously communicate with each other by calling into a common single conference as shown in Figure 11.

CONCLUSION

A system and method has been shown in the above embodiments for the effective implementation of communication triggered just in time information. While various preferred embodiments have been shown and described, it will be understood that there is no intent to limit

5   the invention by such disclosure, but rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention, as defined in the appended claims. For example, the present invention should not be limited by software/program, computing environment, specific computing hardware, and specific calendaring or PIM systems.

10 The above enhancements for personal information management systems and its described functional elements are implemented in various computing environments. For example, the present invention may be implemented on a conventional IBM PC or equivalent, multi-nodal system (e.g., LAN), or networking system (e.g., Internet, WWW, wireless web). All programming, GUIs, and data related thereto are stored in computer memory, static or dynamic,

15 and may be retrieved by the user in any of: conventional computer storage, display (i.e., CRT), and/or hardcopy (i.e. printed) formats. The programming of the present invention may be implemented by one of skill in the art of personal information management systems.